AIR TRANSPORTATION: GOOD AND BAD USES

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Translation of: "Des bons et des mauvais usages du transport aerien," Revue generale de l'air et de l'espace, Vol. 37, No. 1, 1974, pp. 7 - 17.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D. C. 20546 DECEMBER 1974

STANDARD TITLE PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TT F 16,067		

4. Title and Subtitle	5. Report Date
AIR TRANSPORTATION: GOOD AND BAD USES	17 December 1974
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
M. Wolkowitsch	10. Work Unit No.

9. Performing Organization Name and Address	11. Contract or Grant No.
SCITRAN Box 5456 Santa Barbara, CA 93108	NASw-2483
	13. Type of Report and Period Covered
	Translation
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C. 20546	14. Sponsoring Agency Code

15. Supplementary Notes

Translation of: "Des bons et des mauvais usages du transport aérien," Revue generale de l'air et de l'espace, Vol. 37, No. 1, 1974, pp. 7 - 17.

16. Abstract

The present work advocates that, especially in view of the fuel crisis and rising prices in air transport, plans for expanding air services to remoter regions and for short haul purposes be reconsidered. Rather, it would be best to continue improving the quality of air service for those routes where its advantages over other means of transport are undeniable, and to restrain the proliferation of air service where its existence is not absolutely necessary and where the development or improvement of rail transportation, for example, would be more sane and economical.

17. Key Words (Selected by Author(s))	18. Distribution Statement
	Unclassified - Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified		

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New transport techniques have attempted to replace the old ones: J. Labasse writes very wisely that: ". . . Modern illusion is always watching, served with or without selfishness by the professionals. This illusion is at first the well-known [illegible] thought that every new technique is necessarily better than the former one, the taboo of the chronological order reported at the beginning of this book . . .".** /7*

The specific qualities inherent to each mode of transport do not seem to be a major factor in the decision of utilization; men are always ready for a new fad. Air transportation does not escape this rule.

A serious situation has been brought about by fierce competition between airlines, and between airlines and companies representing other modes of transportation. A considerable decrease in the rate of annual traffic growth and the worrisome financial results of these last few years had the more lucid among the people responsible for air transport wondering about the future. In the middle of this bad situation, the energy crisis broke out, with considerable consequences for air transportation. Fuel consumption represents 12 to 17% of the

*Numbers in the margin indicate the pagination of the original foreign text.

**Jean Labasse, "Organization of Space," Paris, 1965, pp. 603 ff.

cost of transportation; the price for fuel increased 47% in the United States between August 1, 1973, and January 31, 1974.

Has air transportation passed from a phase of great prosperity to a period of uncertainty because of a poor utilization? Could rational use of this technology correct the present situation? Those are the problems that we will try to consider.

I. AIR TRANSPORTATION IN TROUBLE

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Only during the past 15 years did air transportation reach full maturity: since 1958, it has represented more than half of the North Atlantic traffic. It developed remarkably during the decade 1960 — 1969, especially in the countries which had a slow start.

The will to expand air transportation to an increasing number of places led to the low-profit lines: in France, the pioneering work of new lines has been made possible by public (Federal, local groups) or private agents (Chamber of Commerce) which were given first to Air Inter, then to the third level airlines (Air Alps — Air Touraine). All modes of transport benefit or have benefited from various assistance, but the expenses are more justified if the character of "service to the public" is more obvious. However, air transport is of interest to a really small segment of the population, even in countries with high living standards. Cities of only a few tens of thousands of inhabitants spend surprising amounts to ensure regular flights by planes of less than 20 seats, whereas their roads and systems of mass transit are completely insufficient. Sooner or later, such ventures are doomed.

The desire for prestige of the cities is matched by the desire for prestige of the airlines and the governments. This state of mind can only increase the difficulties of air transportation, since it solidifies the competition based on profit making. This drive for prestige takes different forms and is expensive for the airlines.

National prestige leads each government to require its part of the international traffic; this creates a multiplication of the number of flights: many African or Asiatic companies have flights to European capitals with planes adapted to transcontinental flights (Boeing 707, DC-10, rarely Ilyushin); the occupancy rates are very low, sometimes on the order of 10 to 20% annually; some flights of several thousand kilometers have less than ten passengers on board. The travelers are mainly nationals on business trips, and technical and cultural representatives recruited by industrial countries. The transportation expenses of both groups are paid for by the interested government, so that this traffic is not even justified by an input of foreign currency.

Industrial countries do not escape this fault: they share with less developed countries the exploitation of the North Atlantic crossings. About 25 airlines compete seriously: 14 from Western Europe, Northern and Mediterranean Europe, 2 from socialist countries (USSR and Czechoslovakia), 4 from the USA and Canada, one from Israel, Japan, Austrailia, and India. If /9 those services were spread equally over one day, there would be a departure every ten minutes from each continent towards the other! In spite of an average daily traffic of about 30,000 passengers, the average load factor is very low: 50% in 1971 versus 59% in 1966; the use of large capacity planes (Boeing 747) worsens the situation. For some companies, the average annual occupancy rate is so low that 2 out of 3 seats are unoccupied.

The politics of prestige is shown again by the necessity of always having the most recent equipment, even if the one in use is not amortized yet. Competition in this realm is very harsh: if these politics have as a goal better traveling conditions to the customer, applied without finesse, this leads to unnecessary financial difficulties. The used equipment market is rarely propitious, and with the advent of the jet plane, the previous models had little value. This decisive improvement in speed should have been offered to the customers on long distance flights. On the shorter hauls, where the jets are poorly used, since they stay at their normal flight altitude for a short time, should the change have been so immediate? Only a few minutes were gained between Paris and London; for this short flight, the actual time in the air represents less than one-third the total time city-to-city, so that the exploitation could very well have been continued up to amortization of the old equipment. The airlines supported this change very eagerly because of its occurrence during an economic period very favorable to air transport; the subsequent technological improvements must have brought about a certain anxiety; the appearance of supersonic aircraft, at times touchy as far as air transportation is concerned, causes great financial worries. This explains in part the severity of the international controversy; it is not in fact a problem of technology as proven by extensive use by the armies of all countries.

The low load factor on long hauls is balanced by domestic travel, especially in the USA; a high frequency is required to make reservations unnecessary, a system still in use in Europe. Between New York and Los Angeles, several hundreds of thousands of seats stayed empty in 1970, representing 56% of the seats available, but what is remarkable is the great number of flights over short distances between 200 and 400 kilometers: there are

28 daily shuttle flights between New York and Philadelphia, and 85 between New York and Washington.

Such a policy rapidly creates a saturation of the air space, leading to the development of new installations, to satisfy a requirement which could well be ensured by means of ground transportation, especially since delays are becoming longer and longer at big airports. This problem occurs not only in New York, it progressively reaches all important centers of the world. /10

New locations for airports must be found on larger and larger areas: today on thousands of hectares, these sites must be located near large cities, i.e., in the most difficult conditions considering the crowded conditions. Two solutions are then possible: the first is to go several dozen of kilometers from the center of the city, with loss of time on the ground; this was done in Tokyo, and adopted in London where the construction of the new airport was to be near Foulness (70 km east of London);* the second is only possible if nearby areas can be cleared, which is the case in Paris at Roissy-en-France, 17 km from Notre Dame; the drawback of this situation is that it is too close to the suburbs and the airport causes nuisances which create difficulties with the population.

In an attempt to fill their planes to capacity, the airlines have a complicated system of rates in favor of people using the less occupied flights with price variations according to: the time of day, day of the week, and time of the year. The rates favor a certain class of travelers with lesser incomes. They are more sensitive to the competition of other means of transportation (youth, senior citizens, groups). Sometimes both types of advantages are combined. Recently, a travel agent

*The labor Government of 1974 seems to be delaying this project for economic reasons.

really could wonder if anybody was paying the regular rate; an exaggeration of course, but if those multiple reductions improve the load factor, they do not solve the problem of the financial balance sheet for many airlines. Many national companies are government-sponsored. Even in the USA, contrary to a widely spread belief, the private airlines received federal aid: the Civil Aeronautics Board granted, between 1961 and 1970, between 40 to 83 million dollars, depending on the year, to the medium and small enterprises. The large companies refused the aid (United, Pan Am, TWA, etc.), but increasing and successive deficits (in the range of 45 million dollars for each in 1970) brought about a change in their policy. In 1974, PAA and TWA claimed 300 million dollars to be the minimal subsidy necessary to operate their international network. So far, the Federal Government has given no response; but this fact is enough to illustrate the extent of the present unrest. Those companies had also submitted a merger proposition to try to decrease their running expenses, but it was turned down because of the law on free enterprise.

As we mentioned earlier, the air transport industry is particularly affected by the high cost of fuel. The consumption is much higher than for other means of transportation: the ratio would be 1:4 between a turbo-train riding at 260 km/hour and a 727 Boeing.* The necessity for Japan and European countries to reduce their oil consumption in order to maintain their financial balance should be directed towards a new utilization of planes. Because of their natural resources, the problem is different for the USA and USSR.

*The consumption of fuel necessary to move a traveler 1 km would be 0.08 liters for a plane, 0.02 for a turbo-train, 0.006 for a classical train, and 0.005 liters for a suburban train.

The energy crisis casts a doubt on the prediction that 1970 — 80 would be the era of mass air freight; Lufthansa started operation of an all-freight Boeing 747 able to transport 100 tons; serving the North Atlantic, it has enjoyed a load factor of 2/3 in 1972, but this was before the increase in the cost of freight. Air France is expecting a similar plane for 1975. Freight rates for transport by sea remain unmatched. The modernization of handling and packaging merchandises (containers, roll on, roll off) has taken away some of its advantages from air freight (economy on insurance, packing).

Air transport is experiencing a difficult era. The present crisis comes certainly from the fact that the rate of its development, exceptional for 20 years, is now going to be based on the economical growth of each country. A slight uneasiness existed before the energy crisis; the latter has only hastened and deepened the already visible tendencies. Only a new conception of the use of air transport could correct the situation: its first quality, speed, must be reserved for use over distances long enough to show an improvement in time, conditions, and possibilities of travel. The absurdity of the low load factor leading to a rapid and useless saturation of the airports and to deficits must be counteracted. New international agreements could distribute the flights among the companies, taking into account the real needs. Only then will the air transportation find its balance, and keep its place in a harmonious development of the means of transportation.

II. BAD AND GOOD USES OF AIR TRANSPORTATION /12

1. Bad Uses

The few bad uses are the very short hauls, where the time gained is negligible if we take into account the trip between the airport and the city. To how many passengers are time gains of less than an hour indispensible? Are those advantages worth the delays caused to the long distance flights, or the obligation of moving forward the investment date to create new airports further from the cities with all the discomfort that they will bring to new segments of the population? Is the saturation of the air space by planes going to Lille, Brussels, Metz, Poitiers reasonable? These cities can be reached by train in 1 hour 55 minutes, 2 hours 20 minutes, 2 hours 42 minutes, and 2 hours 10 minutes, respectively.

The railways easily compete with the airplanes on distances of 300 km with speeds of 160 — 200 km/hour; above 300 km, the speed must be 200 — 300 km/hour; the North-East line (New York, Philadelphia, Washington) is built on this basis as is the Tokaido line. The line in construction between Florence and Rome (236 km) will allow speeds of 157 km/hour. The development of the Paris-Bordeaux line will allow the Aquitaine to accomplish this trip in 4 hours, that is at 147 km/hour for 588 km. The European railways have planned 5785 km of rapid lines (Paris-Lyon, London-Paris, Brussels, etc.). The Japanese lines have a similar distance. The Americans are thinking of a New York-Boston line, and in the Midwest, French-made turbo-trains have been tested over a period of 2 years (Spirit of St. Louis).

The reaction of the airlines to this renovation of the railways system has been negative, and the delay in realization of the Paris-Lyon line is the result of pressure exerted by groups related to the air transport industry (companies and manufacturers). This opposition appears to be short sighted: the example of Japan is here to prove it. The worries caused by the opening of the new lines Tokyo-Nagoya-Osaka soon vanished: the traffic for Nagoya (300 km) has disappeared, but the traffic for Osaka (550 km) has rapidly increased to a volume larger than the one prior to the railway competition. Also, the railway system is oriented towards serving a broader spectrum of the population, first of all by its rates (all the rapid lines have two classes) and also by the number of hauls accomplished where no other means of transportation are available.

The investments earmarked for transportation represent a precise goal: a choice must be made between the different means of transportation. What must be the priority - a mass transit technique at relatively low cost, or aviation limited to a minority of people? This is a constant problem, as proven by the examples above. If, for certain routes, the efforts are justified in favor of the transportation by air, for others they can only be made at the expense of the communities who will have to wait longer for necessary equipment. /13

Ambitious plans are now in process for opening the Southern Alps to air traffic: the airport of Gap-Tallard has limited use only, because of the topography of the area. Four thousand persons traveled to Paris. One plan calls for a 160 Ha airport (Sisteron-Theze) with runways of 2.410 km for landings and 2.700 km for takeoffs; this airport would be open to the Mercury and Boeing 727 aircraft, then to charter services. This valley-type airport would be designed for tourism and

winter sports in the areas poorly served by the peripheral airports of Marseille-Marignane and Nice-Cote d'Azur. From Sisteron, the ground transportation to Brianconnais, Champsaur, the Devoloy, Ubay, would be shorter; also, a dozen heliports* would make the connection between the Sisteron Airport and the tourism areas. This type of route is of little interest and does not justify the large money expenditures necessary. In winter, the line Paris-Courchevel transports about eighteen passengers a day in each direction. In 1985 (forecast), the Sisteron Airport should welcome 45,000 Parisians, 40,000 foreigners, and 15,000 persons from the "Massif Central" (Clermond-Ferrand area). The traffic of tourists in summer is hardly mentioned; it probably will be nonexistant, since one cannot imagine a tourist on holiday in a resort without his car.

These ambitious projects, with a first stage already decided, will require 40,000,000 1973 Francs for the one airport of Sisteron. The surrounding area has less than 150,000 inhabitants with a density of 12 inh/km^2. The potential customers seem few for such a large airport, considering the nature of the local activities: a few engineers of the Chateau Arnoux Plant, department or national administrators on business for whom the trip to Paris would be reduced to 1-1/2 hours. The operating conditions are not simple. Even if the fog is a rare occurrence, which is not proven for the Valley of the Durance, and the crosswinds of more than 5 m/sec are limited to 6.4% of the time, i.e., a utilization factor of at least 93.6%, a use deficit is forecast right from the start, and the professions which benefit from the touristic development will be asked to contribute. However, they might refuse, and by

*Cervieres, Isola, Jausiers, Molieres, Valberg, Auron, LaFoux d' Allos, Orcieres, Queyras...

which principles can they be forced to it? If we consider, on the other hand, that by 1980 the Alps-Freeway will reach Sisteron, and bring it to within 1-1/4 hours from Marignane Airport, we can really wonder about the necessity of such construction and if the credit granted to Sisteron Airport would not be better used for the realization of mass transit equipment completely lacking in the center of the large metropolitan area of Marseille. /14

It is not our aim to condemn the aviation in mountains, and we wish a greater development of the emergency air services for isolated villages. We can accept the creation of an airport centralizing this activity for the Southern Alps, but the airplanes adapted to this traffic will not require the gigantic effort equivalent to a type B airport necessary for planes of the Mercury size. The hypothetical transportation of a few dozen thousand tourists in another decade does not justify the projects and appears to have symptoms of the poor use of the airplane.

2. Good Uses

There are many undisputable good uses. We will mention the main ones and give a few concrete examples.

As distance increases, the airplane becomes the mean of transportation "par excellence" for the traveller. In this case, everything depends on the quality and conditions of exploitation of the continental infrastructures. In the Third World countries, the airplane is superior even on short hauls, considering the conditions of the ground network. The commercial speed is 63 km between Algiers and Constantine, and 78 km between Algiers and Oran. Over distances of 450 km, air transport is much more rapid. Many railways in the Third

World do not reach even those averages. An identical situation is found in the northern countries where nature is hostile by its terrain and climate to the development and exploitation of transport networks. The superiority of the air transport is obvious in Scandinavian transportation systems, especially since the extension in latitude creates long distances, such as in Italy (Table I). The superiority is also obvious where the railway networks are saturated by numerous freight trains, leaving no possibility for the circulation of rapid passenger trains: this is a common situation in the Eastern European countries.

The plane is also very good as soon as, on short hauls, it avoids transshipments: as in the crossings of channels: the one between England and the Continent, the lines between Danish channels, represent a great time savings when the plane reduces the successive sea and ground legs of the trip. The Copenhagen-Hamburg (360 km by train) trip decreases from 5 to 2-1/4 hours by plane. From Paris to London (381 km via Dieppe, 511 via Dunkirk), the trip by ferry boat and train takes 7 hours versus 2-1/2 to 3-1/2 by plane, depending on the duration of transportation between airport and city. This is why we have the density of the air traffic. In 1971, more than 23 million passages were counted along the various itineraries between Pas-de-Calais and the North Sea (Ostende, Hoek van Holland) and by air: 62.5% of the passengers (almost 15 million) travelled by plane; half (4,070,000 of 8,250,000) of the travelers faithful to the ferry boat did so because they were going with their car. /15

The ferry boats are then useful where many tourists want to travel with their car; the same fact applies to the Mediterranean island traffic (about 800,000 passengers to Corsica in 1971) or international transport (Maghreb, Italy, or Greece, etc.). When one has to cross oceans or thousands of miles on ground

TABLE I

COMPARISON BETWEEN AIR AND RAILWAY TRANSPORTATION IN SCANDINAVIA

Route	Distance	Railroad			Air	
		Commercial speed	Duration of trip	No. of connections per day	Duration of trip	No. of connections per day
Oslo-Bergen	471 km	70 km/h	6 h 45	3	0 h 45	10
Oslo-Bödö	1 282 km	60 km/h	19 h 30	2	2 h 10	2
Oslo-Trondheim	553 km	70 km/h	7 h 05	3	0 h 50	7
Trondheim-Mo i Rana	498 km	66 km/h	7 h 33	2	1 h 50	2
Stockholm-Göteborg	456 km	114 km/h	3 h 58	12	1 h 00	7
Stockholm-Malmö	599 km	96 km/h	5 h 50	10	0 h 55	8
Stockholm-Luléa	1 141 km	72 km/h	15 h 50	3	1 h 10	3**
Stockholm-Kiruna	1 373 km	72 km/h	18 h 54	3	2 h 10	2

*Airport to airport.

**Five services connect Stockholm and Lulea, service various legs.

transportation, the airplane is indisputably superior: 95% of the North Atlantic traffic, 75% of the traffic between Moscow and the USSR Far East. The liners have progressively stopped to play a role in the long haul routes. They are defeated both on the basis of the price, and of time. In the USSR, in 1970, the air transport carried 14.3% of the traffic, versus 48.3% for the train, 36.1% for the road transport, 1% for inland navigation, and 0.3% for coastal trade. Life centers isolated by inhospitable deserts cannot hope for other contact with the world other than by plane: numerous lines are /16
criss-crossing the Taiga, serving the sea ports of the North on the delta of the Siberian rivers, or on the Sea of Ohkotsk

in the Soviet Far East. Certain South American areas offer a similar air transport service in a natural setting quite different, such as the Amazon or the Andex. The plane has brought about the discovery of many mountain areas of Columbia.

The air freight rates have been an efficient element for a more rational transportation of goods. Certain areas are reserved for the plane: the transportation of valuable products able to pay for a high freight cost (perfumes, fashion, precious metals), of perishables whose value increases with distance (flowers sent from Nice to England, Scandinavia, Switzerland). The speed reduces the duration of transport. The time of immobilization of the merchandise is shorter. The interest computed on the capital is decreased. From Paris to Detroit, for example, one shipments takes 22 days by sea and 4 by air. The delay is calculated from the start at the sender to the delivery to the consignee. Under those conditions, air transport would become competitive for industrial cargo such as electronic parts. It would be also profitable for the shipment of spare parts, where it would avoid the immobilization of the capital represented by the machines. The car industry uses this means of communication for an efficient supply of its servicing network in North America.

Aviation also plays a role in the pioneer areas: this is where the plane, beyond all obstacles, can also ensure heavy transport: mine equipment, supplies. The areas where the help of air transport has been a decisive factor are many: the development of petroleum drilling in the deserts is well known, but airplanes also brought 150,000 tons of cement necessary to build the train serving iron mines in Labrador. This was the price paid for strengthening the railway line through the moors.

But air freight does not represent 1% of the exchange of merchandise over the North Atlantic. In a large country like the USSR, in 1970, it represented only 0.1%, versus 4.5% for inland navigation, 5.7% for the ground transportation, 7.4% by piplines (gas and oil), 17.1% by coastal trade, and 65.2% by train.

To establish a balance sheet, we must underline the great possibilities of air transport, which in many cases cannot be replaced, even for moving of certain merchandise. Aviation, in a broader context, appears to be the more promising way to break the isolation of populations living in mountainous or isolated areas. It then has a fundamental role to play in the development of new areas. /17

From now on, we should try to improve air transport in cases where it cannot be compared to the services offered by other modes of transportation, and not impose its development at all costs where it is not necessary. This policy, economical for the public groups suffering from competition through the grants given to the various modes of transportation, seems also to be healthy for the airlines themselves who cannot ignore that the saturation of the air space has limits. The quality of services for which the air transportation is excellent is often a victim of the multiplication of unnecessary short and middle length runs. It is our hope that the energy crisis as much as the financial difficulties of the airlines will bring about necessary and reasonable decisions.

Translated for National Aeronautics and Space Administration under Contract No. NASw-2483 by SCITRAN, P. O. Box 5456, Santa Barbara, California 93108.